DETAILED ACTION

Status of Claims

1. Claims 1-21, filed April 14th, 2011, are currently under examination. Claims 1-21 were amended and claims 9 and 10 are withdrawn.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted April 14th, 2011 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner. Please refer to applicants' copy of the 1449 form submitted herewith.

Rejoinder of All Previously Withdrawn Process Claims

3. Claim 1 (as shown in the Examiner's amendment below) is directed to an allowable product. Pursuant to the procedures set forth in MPEP § 821.04(b), claims 9 and 10, directed to the process of making or using an allowable product, previously withdrawn from consideration as a result of a restriction requirement, are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

Because all claims previously withdrawn from consideration under 37 CFR 1.142 have been rejoined, **the restriction requirement as set forth in the Office action mailed on September 10th, 2008 is hereby withdrawn.** In view of the withdrawal of the restriction requirement as to the rejoined inventions, Applicants are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such

claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Examiner's Amendment

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Todd D. Reynolds on April 18th, 2011.

Start of Claim Amendments

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1. (Currently amended) A heavy gauge seamless steel pipe ~~of high mechanical resistance, good degree of toughness, good resistance to cracking in the metal base and the heat affected zone (HAZ) and good corrosion resistance,~~ characterized by the material of which it is manufactured being made up of basically of Fe and the following chemical composition expressed in % by weight of additional elements:

C	0.06 to 0.13
Mn	1.00 to 1.30
Si	0.35 Max.
P	0.015 Max.
S	0.003 Max.
Mo	0.1 to 0.2
Cr	0.10 to 0.30
V	0.050 to 0.10

Nb	0.020 to 0.035
Ni	0.30 to 0.45
Al	0.015 to 0.040
Ti	0.020 Max.
N	0.010 Max.
Cu	0.2 Max.

and also the chemical composition with the following relation among the alloying elements:

$0.5 < (Mo + Cr + Ni) < 1$

$(Mo + Cr + V)/5 + (Ni + Cu)/15 \leq 0.14$;

wherein the seamless steel pipe has a microstructure formed by re-heating to an austenitic temperature followed by water quenching and a tempering treatment that results in a microstructure having austenite grains with an average size from ASTM 10 to 20 microns.

2. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardness, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 1, also characterized by a Titanium content of no more than 0.002% by weight.

3. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 1, also characterized by the presence of a resistance to cracking measured by the CTOD test at a temperature of -40 °C $\geq$ 0.8 mm in the metal base and a CTOD test at a temperature of 0 °C $\geq$ 0.5 mm in ~~the~~ a heat affected zone.

4. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 1, characterized by ~~the~~ a resistance to corrosion measured by the HIC test in accordance with norm NACE TM0284 with solution A being 1.5% max. for CTR and 5.0% max. for CLR.

5. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 1, characterized by having heavy gauge walls $\geq$ 30 mm.

6. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 5, characterized by having heavy gauge walls $\geq$ 40 mm.

7. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in any of the previous claims 1 through 6, characterized by possessing the following properties:

$YS_{Troom} \geq 65$ Ksi

$YS_{130°C} \geq 65$ Ksi

$UTS_{Troom} \geq 77$ Ksi

$UTS_{130°C} \geq 77$ Ksi

The energy absorbed was evaluated at a temperature of up to -10°C $\geq$ Joules

Hardness $\leq$ 240 HV10 maximum.

8. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in claim 1, characterized by possessing the following properties:

$YS_{Troom} \geq 65$ Ksi

$YS_{130°C} \geq 65$ Ksi

$UTS_{Troom} \geq 77$ Ksi

$UTS_{130°C} \geq 77$ Ksi

YS/UTS $\leq$ 0.89

Elongation $\geq$ 20%

Energy absorbed evaluated at a temperature of up to -20°C> 380 Joules

Shear Area at -10°C = 100%

Hardness $\leq$ 220 HV10.

9. (Currently amended) A process for manufacturing a seamless steel ~~pipe with high mechanical resistance, good toughness, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~, the process comprising:

manufacturing a steel;

obtaining a solid cylindrical piece from the steel;

perforating said solid cylindrical piece to form a steel pipe;

rolling said steel pipe to form a rolled pipe;

subjecting the rolled pipe to a heat treatment comprising re-heating to a austenitic temperature followed by water quenching and a tempering treatment that results in the seamless steel pipe having a microstructure having austenite grains with an average size from ASTM 10 to 20 microns,

wherein said process is characterized by the addition of certain amounts of elements during the manufacturing and the elimination of other elements so as to produce a final composition in % by weight that contains, besides iron and inevitable impurities, the following:

C	0.06 to 0.13
Mn	1.00 to 1.30
Si	0.35 Max.
P	0.015 Max.
S	0.003 Max.
Mo	0.1 to 0.2
Cr	0.10 to 0.30
V	0.050 to 0.10
Nb	0.020 to 0.035
Ni	0.30 to 0.45
Al	0.015 to 0.040
Ti	0.020 Max.
N	0.010 Max.

Cu 0.2 Max.

and also the chemical composition complying with the relationship among the alloying elements:

$0.5 \leq (Mo + Cr + Ni) < 1$

$(Mo + Cr + V)/5 + (Ni + Cu)/15 \leq 0.14$.

10. (Currently amended) A process for manufacturing seamless steel pipe as claimed in claim 9 characterized by said heat treatment consisting of austenitizing to a temperature of between 900°C and 930°C, followed by interior-exterior hardening in water and then heat treatment for tempering at a temperature of between 630°C and 690°C as defined by the following equation:

T_{temp} (°C) = [- 273 + 1000/ (1.17 - 0.2 C - 0.3 Mo - 0.4 V)] + / - 5.

11. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 2, also characterized by the presence of a resistance to cracking measured by the CTOD test at a temperature of -40°C $\geq$ 0.8 mm in the metal base and a CTOD test at a temperature of O°C $\geq$ 0.5 mm in ~~the~~ a heat affected zone.

12. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 2, characterized by ~~the~~ a resistance to corrosion measured by the HIC test in accordance with norm NACE TM0284 with solution A being 1.5% max. for CTR and 5.0% max. for CLR.

13. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 3, characterized by ~~the~~ a resistance to corrosion measured by the HIC test in accordance with norm NACE TM0284 with solution A being 1.5% max. for CTR and 5.0% max. for CLR.

14. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 2, characterized by having heavy gauge walls $\geq$ 30 mm.

15. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 3, characterized by having heavy gauge walls $\geq$ 30 mm.

16. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ, and good corrosion resistance~~ as in claim 4, characterized by having heavy gauge walls $\geq$ 30 mm.

17. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in claim 2, characterized by possessing the following properties:

$YS_{Troom} \geq 65$ Ksi

$YS_{130°C} \geq 65$ Ksi

$UTS_{Troom} \geq 77$ Ksi

$UTS_{130°C} \geq 77$ Ksi

$YS/UTS \leq 0.89$

Elongation $\geq 20\%$

Energy absorbed evaluated at a temperature of up to -20°C $\geq$ 380 Joules

Shear Area at -10°C = 100%

Hardness $\leq$ 220 HV10.

18. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in claim 3, characterized by possessing the following properties:

$YS_{Troom} \geq 65$ Ksi

$YS_{130°C} \geq 65$ Ksi

$UTS_{Troom} \geq 77$ Ksi

$UTS_{130°C} \geq 77$ Ksi

YS/UTS ≤ 0.89

Elongation $\geq 20\%$

Energy absorbed evaluated at a temperature of up to -20 °C $\geq$ 380 Joules

Shear Area at -10°C = 100%

Hardness $\leq$ 220 HV10.

19. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in claim 4, characterized by possessing the following properties:

$YS_{Troom} \geq 65$ Ksi

$YS_{130°C} \geq 65$ Ksi

$UTS_{Troom} \geq 77$ Ksi

$UTS_{130°C} \geq 77$ Ksi

YS/UTS ≤ 0.89

Elongation $\geq 20\%$

Energy absorbed evaluated at a temperature of up to -20°C $\geq$ 380 Joules

Shear Area at -10°C = 100%

Hardness $\leq$ 220 HV10.

20. (Currently amended) The seamless steel pipe ~~with high mechanical resistance, good hardening, good resistance to cracking in the metal base and in the HAZ and good corrosion resistance~~ as in claim [[4]] 5, characterized by possessing the following properties:

$YS_{Troom} > 65$ Ksi

$YS_{130°C} > 65$ Ksi

$UTS_{Troom} > 77$ Ksi

$UTS_{130°C} > 77$ Ksi

YS/UTS < 0.89

Elongation > 20%

Energy absorbed evaluated at a temperature of up to -20°C > 380 Joules

Shear Area at -10°C = 100%

Hardness ≤ 220 HV10.

21. (Currently amended) The seamless steel pipe of claim 1, wherein the seamless steel pipe possesses a lower bainite microstructure, polygonal ferrite below 30% with ~~small~~ regions of martensite ~~high in C~~ with retained austenite dispersed in the matrix.

End of Claim Amendments

Allowable Subject Matter

5. Claims 1-21 are allowed.

Reasons for Allowance

6. The following is an examiner's statement of reasons for allowance:

The closest prior art of Kondo (JP 09-235,617) disclosed a seamless steel pipe having an overlapping composition are compared to the instant claims but does not disclose the claimed austenite grain size of ASTM 10 to 20 microns and would not be reasonably expected to in view of Mr. Garcia's 1.132 affidavit filed April 14th, 2010. This affidavit shows that the Kondo's method of directly quenching the pipe (AFD Figure 1, page 2) results in austenite grain sizes clearly above the range claimed (p. 8, Table V, section 16).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday-Friday, 8:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King, can be reached at (571) 272-1244. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

/Mark L. Shevin/
Examiner, Art Unit 1733

April 18th, 2011
10-554,075

/George Wyszomierski/
Primary Examiner
Art Unit 1733